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Site Selection Process for the Department of Energy's Super Collider

Statement of Flora H. Milans
Associate Director, Energy Issues
Resources, Community, and
Economic Development Division

Before the
Committee on Science, Space,
and Technology
U.S. House of Representatives

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Mr. Chairman and Members of the Committee:

We are pleased to be here today to discuss the Department of Energy's (DOE) best qualified and final site selection processes for the superconducting super collider. We have issued a report on the selection of the seven best qualified sites in response to a request by Senator Trent Lott and this committee. We also are completing a review of the selection of the final site in response to a request by Senator DeConcini on behalf of himself and Senators Dixon, Levin, Riegle, Simon, and Wirth.

The first request asked us to assess the fairness of the process for selecting the best qualified sites. In general, we determined that the National Academy of Sciences/National Academy of Engineering site evaluation committee used DOE's site selection criteria in their order of importance and that the process was fair. However, we recommended that, for any future site selection process similar to the super collider's, the Secretary of Energy ensure that potential site proposers be given the maximum information possible in the invitation for site proposals about the relative importance of the selection criteria.

The second request asked us to address whether the general evaluation process and the bases for the DOE site task force's ratings--and therefore, the distinctions among sites--were consistent with the technical criteria established in DOE's invitation. We briefed Senator DeConcini on this review before this hearing, and he has agreed to our discussion of the preliminary findings today before the report is issued. We found that the task force used the invitation's technical criteria to evaluate the proposed sites and, overall, provided evidence to support its ratings.

THE ACADEMIES' COMMITTEE EVALUATION

First, I would like to address our earlier review of the process for selecting the best qualified sites. As you know, our report Federal Research: Determination of the Best Qualified Sites for DOE's Super Collider, issued January 30, 1989, addresses (1) the composition of the National Academy of Sciences/National Academy of Engineering site evaluation committee, (2) the committee's use of DOE's criteria and the impact of DOE's decision not to have the committee make site visits, (3) the committee's analysis of the proposed sites' costs, and (4) DOE's review of the committee's list of best qualified sites.

In summary, we found the following:

-- The academies' 21 committee members had expertise in many diverse fields related to the site selection criteria and were geographically representative.

-- While the committee used DOE's site selection criteria in their order of importance, the DOE invitation could have provided better information about the relative importance of the regional resources criterion. In addition, committee members stated that site visits were impractical given the time constraints imposed and the number of visits that would have to be made. They also said the proposals were generally well-written and complete.

-- Sites' costs were a minor factor in the committee's identification of the best qualified sites because of the narrow percentage range of cost estimates.

-- DOE accepted the committee's best qualified list of sites on the basis of its own site task force's review of each

proposed site, the committee's report, and a briefing by the committee's staff.

Members Selected for Their Expertise

The academies' committee chairman and staff stated that 21 members were chosen for the committee to ensure that it had sufficient expertise to evaluate site proposals against each of the selection criteria. Any person associated with a proposal was disqualified. Eight members were associated with the Universities Research Association, Inc., the operations contractor for DOE's Fermi National Accelerator Laboratory, which is encompassed by Illinois' proposed site.

Evaluation Was Based on Criteria

The committee selected these seven sites using the technical and cost criteria established in DOE's invitation. The committee principally used the geology and tunneling and the regional resources criteria to discriminate between proposals. Regional resources played a greater role in the committee's evaluation than some of the site proposers had expected. In August 1987, 1 month before the proposals were due, experts, including one current and two former DOE laboratory directors, emphasized to the committee the importance of regional resources for the super collider's scientific productivity. If this information had been made available to the states in the April 1987 invitation, it might have influenced how some proposers responded to the invitation.

Costs Were a Minor Factor in Evaluation

The committee did not use costs to discriminate between the proposed sites (1) because the sites' cost estimates were within 3.3 percent of the $11.2 billion average cost of all sites to construct and operate the super collider and (2) because of

uncertainties about future costs over the super collider's 33-year life. We found no basis to disagree with the committee that the relatively narrow percentage range of cost estimates and the comparable range of the cost data's uncertainty considerably weakened its ability to distinguish between sites' expected costs. However, we noted that the committee's analysis of the sites' costs was limited because DOE did not verify the reliability of the model's data, restructure the model to allow a discounting of future costs, or reexamine the model's assumptions about the percentage of the super collider's cost components that would be purchased on national as opposed to regional markets.

DOE Accepted Committee's List

DOE's site task force members said that they reviewed the committee's best qualified list to determine whether it was supportable and reasonable, making their own assessment of the strengths and weaknesses of each of the 35 sites. Task force members did not attend subgroup or committee meetings in which the proposals were evaluated, and the committee did not give DOE a written assessment of each proposal. Consequently, task force members relied on a day-long briefing by the committee's staff to obtain information about the committee's evaluation of each site.

We also interviewed senior officials from 11 states whose proposed sites were not judged best qualified. The officials were generally satisfied with DOE's invitation for site proposals. However, if it had provided more information about the relative importance of the regional resources criterion in the site evaluation process, four officials said that they might have (1) selected alternative sites or (2) decided they did not have the regional resources to successfully compete and would not have spent between $700,000 and $2.4 million to prepare each site proposal. We believe DOE could have better indicated in its invitation the

relative importance of the regional resources criterion for the super collider's scientific productivity.

DOE'S FINAL SITE SELECTION

Now, I would like to discuss our ongoing work on DOE's final site selection process. Senator DeConcini's office asked us to provide information on whether the DOE task force (1) verified data that states submitted and considered the changes made to the draft environmental impact statement in its rating of the sites against DOE's criteria, (2) gave evidence to support its technical evaluation of each site, and (3) considered environmental and geological concerns raised by Texas residents.

Our preliminary findings are the following:

-- The task force relied on information provided by the states and verified information primarily through its site visits to the seven best qualified sites and through the environmental impact statement process. The task force assessed public comments on the draft environmental impact statement and determined that none sufficiently justified changing any of its ratings for the technical evaluation criteria. However, we noted that the task force would have had to conduct additional field studies to determine the impact of a potentially significant environmental issue at the Tennessee site.

-- Our limited analysis provided us no reason to question the decision to site the super collider in Texas. In evaluating and rating the sites, the task force used DOE's criteria and provided evidence to support its ratings. However, the task force did not provide sufficient documentation for us to (1) resolve an apparent inconsistency between its rating of Illinois as outstanding

for the geology and tunneling criterion and its estimate that Illinois would have the second highest underground construction costs and (2) determine the appropriateness of its use of a weakest-link theory to evaluate the electrical power subcriterion.

-- DOE and its contractors analyzed three concerns identified by Texas residents as part of the site evaluation and environmental impact statement processes and determined that these concerns were not serious problems. According to DOE officials, each of these concerns will be analyzed in more detail as part of the preparation for construction at the Texas site.

The Site Evaluation Process

Before discussing our observations about DOE's evaluation further, I would like to cover what the task force did to evaluate the sites during its preferred site evaluation process. The DOE task force evaluated and rated each of the seven best qualified sites on the basis of information that the states provided in their site proposals and subsequent submissions. The task force verified these data through 4-day visits to each site; discussions and correspondence with officials from federal, state, and local governments, public utilities, and other organizations; and information obtained through the environmental impact statement process.

We interviewed senior state officials responsible for each of the seven proposals to identify potential problems and concerns with the site selection process and the task force's evaluation of the sites. We found that while officials representing the seven sites were generally satisfied with DOE's overall process for gathering and verifying data, officials of four states expressed concern about the timing of the site evaluations in relation to the

environmental impact statement process. DOE task force members acknowledged that the final environmental impact statement assessment changed in some significant areas for several states. Additional environmental data were collected after the task force initially evaluated and rated the technical criteria for the sites. However, according to task force members, they subsequently examined these data and the revised assessments of the potential environmental impact for each site and concluded that the information did not justify changing any criteria or subcriteria ratings.

The Task Force's Evaluation

Our limited analysis provided us no reason to question the decision to site the super collider in Texas. We found that the task force evaluated and rated the proposed sites in accordance with the technical and cost criteria, and provided evidence to support its ratings. In addition, the chairman of the National Academy of Sciences/National Academy of Engineering site evaluation committee told us that Texas was a very good site. The chairman found no glaring inconsistencies between the task force's and the committee's evaluations of the sites.

However, the task force did not provide sufficient documentation for us to resolve the following:

-- First, the task force rated Illinois outstanding overall for the geology and tunneling criterion even though its life-cycle cost estimates for the seven sites showed that Illinois was the second most costly site for underground construction and substantially more costly than three other sites that had lower ratings. Geologists associated with the site selection process said that the geology and tunneling criterion reflected practical concerns about construction costs, schedule delays, and risks associated

with uncertainties. The chairman of the task force's geology and tunneling subcommittee said that Illinois' higher costs reflected mainly costs associated with deeper tunnel shafts that would pass through water-bearing rock, rather than the tunnel construction. He also noted that the cost estimate did not consider contingency factors for each site, which for Illinois would be minimal because of its excellent geological database.

-- Second, to evaluate the electrical power subcriterion, the task force used a weakest-link theory, which maintained that the quality of the sites' power service was only as good as the weakest link in the electric power factors that the task force considered. This resulted in a rating of good for all of the sites in this subcriterion. Alternatively, as it did with the other technical criteria and subcriteria, the task force could have weighted the electrical power factors and differentiated between states on the basis of its ratings for the more important factors.

-- Third, from public comments on the draft environmental impact statement, the task force and contractor personnel received significant information about networks of underground caves that are located in the northern part of the Tennessee site. This information raised questions about the super collider's environmental impact at the site because little is known about whether the cave network at the site and further downstream is a sensitive habitat for any threatened or endangered species. While the task force decided not to change any of its ratings for Tennessee on the basis of this information, some task force members and contractor personnel expressed concern that the caves could pose greater environmental and construction problems than expected at the Tennessee site.

Concerns of Residents Near the Texas Site

Residents living near the Texas site identified concerns about the hazards posed by fire ants, the reliability of Texas' geological data, and the potential hazard to nearby residents from increased levels of radiation exposure. DOE and contractor officials told us that they had considered these issues and had not identified any significant problems. They noted, however, that DOE will examine these issues further in the supplemental environmental impact statement and as DOE does more core hole drilling to characterize the Texas site more completely. In addition, according to officials from four power utilities that service fire ant-infested areas in the United States, fire ants have not caused any major power outages in their systems and they would consider fire ants a nuisance rather than a serious hazard to the super collider's workers and its electric power supply.

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In summary, while our recently issued report identified an area for improvement and our ongoing work indicates some unresolved questions, both the academies and DOE used the criteria established in DOE's invitation for site proposals to evaluate the proposed sites and provided evidence to support their ratings.

This concludes my statement, Mr. Chairman. I would happy to answer any questions that you or other Committee Members might have.